

# Researchers at Y. develop bread that may have it all

By Sheridan R. Hansen 31 Aug '89  
Deseret News staff writer

PROVO — If you're in the market for a whole-wheat bread with more protein, more fiber and fewer calories, you may be in luck if the work of two Brigham Young University researchers is successful.

After three years of mixing just the right amount of baker's flour, wheat germ, soy fiber and several other items needed for the best bread, John H. Johnson, professor of food science, and Amy Gueck, director of the quality-assurance lab at BYU's Ezra Taft Benson Agriculture and Food Institute, feel good about the quality of their bread and may soon have a marketable product.

The bread, known in its test state as Nu-Manna Bread, contains enriched flour (bleached wheat flour, niacin, reduced iron, thiamin, riboflavin), wheat gluten, wheat germ, soy protein, sucrose, soy fiber, yeast, salt, dried yeast, calcium acid phosphate (a nutrient), malt and calcium propionate (a mold inhibitor).

Johnson says the bread has twice the protein of regular whole-wheat bread and three times as much as white bread.

It has 15 percent fewer calories than whole-wheat bread, with 30 percent less starch, 60 percent less fat and 10 percent

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John Hal Johnson and Amy Gueck display samples of their new bread with more protein and fiber.

PHOTOGRAPHY/ STUART W. JOHNSON

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# Hercules built 2 parts of Hubble telescope

■ **Utah contribution:** Optical bench and antenna support ribs were made at W.V. plant.

**By Joseph Bauman**  
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Two vital components of the Hubble space telescope, presently in orbit being readied for its 15 years of high-tech astronomy, were built by a Utah business, Hercules Aerospace Co.

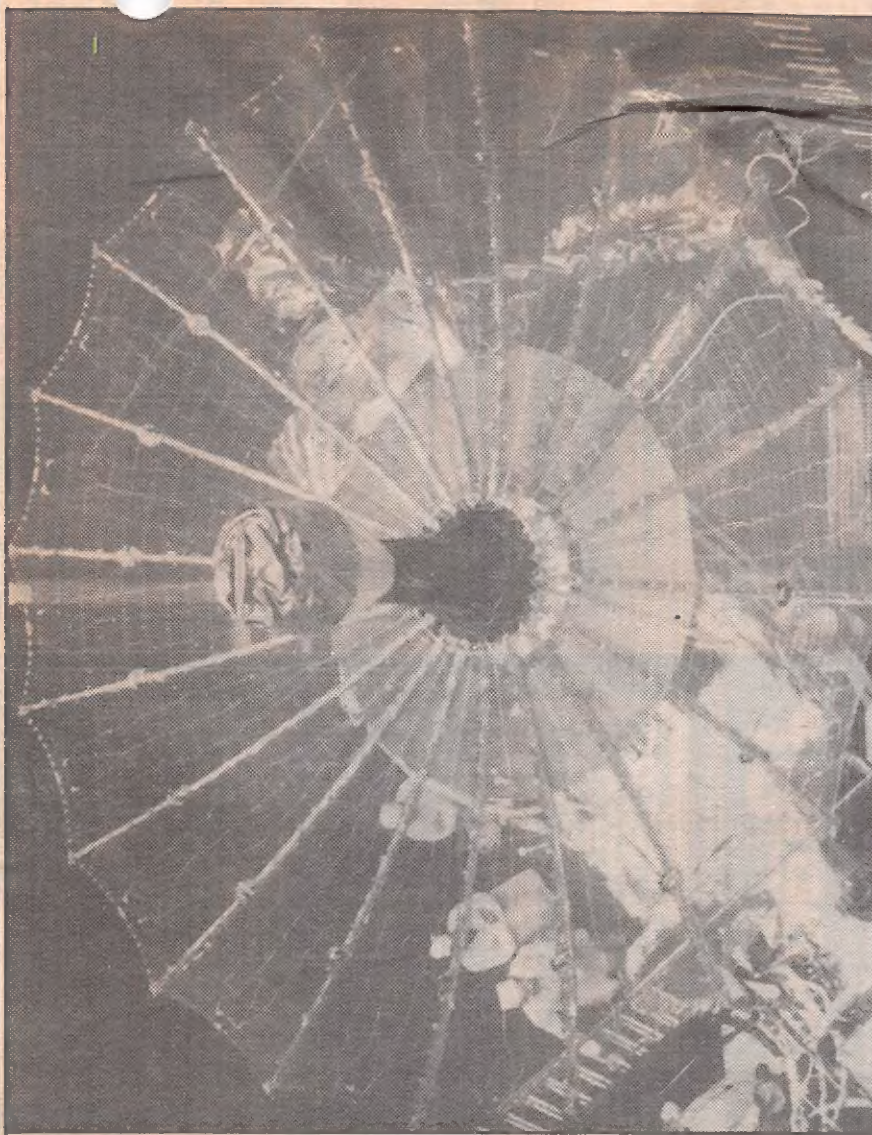
The "HRS Optical Bench" and the antenna support ribs for the data relay satellite were fabricated at Hercules' composite structures facility in West Valley City, called Plant 3.

A special graphite epoxy "bench" for one of the telescope's six scientific instruments was built at the Bacchus Works. The bench is 7 feet long and 4 feet wide and weighed, when it was on Earth, 100 pounds.

The graphite epoxy is required as part of the aiming system, which must be able to point at a target with an accuracy of 0.007 of an arc second. This is equivalent to "focusing on a dime in Los Angeles while standing on a carousel in San Francisco rotating at 17,000 miles an hour," said David L. Nicponski, manager of governmental affairs for Hercules.

To get that accuracy, graphite fiber was used because the fiber doesn't expand and contract in the harsh space environment. The bench's length is expected to change less than 0.0004 of an inch over a 100-degree temperature change.

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The support ribs for the data relay satellite were made at Hercules Bacchus Works.

## HERCULES

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The tracking and data relay satellite system's communications dish is made of special material. The ribs making up the dish spread out when it is opened, like a flower opening.

The tapering curved tubes extend 14 feet across when the dish is employed. The satellite is supposed to forward data from the telescope down to earth.

According to a NASA spokesman, the Hubble space telescope "will en-

able man to gaze farther into space than now possible. Some scientists believe that it might provide views of galaxies at the time they were formed, approximately 15 billion years ago."

It will also study features such as quasars, nebulae and stars many times fainter than those that can be seen by the most powerful ground-based telescopes.

"The space telescope will search for planets that orbit other stars in the same way the Earth orbits the sun," the spokesman added. "Such a discovery could impact our strategy for detecting life-supporting planets."